Rep. Bd Agric. Bermuda.

IMPERIAL MYCOLOGICAL INSTITUTE
6 JUL 1936

BERMUDA

REPORT

of the

DEPARTMENT

of

AGRICULTURE

for the Year

1935

CONTENTS

	PAGE
Personnel of Board and Department	2
Letter of Transmissal	3
Report of Director of Agriculture	5
AGRICULTURE IN 1935	5
Export Markets	5
Domestic Market	8
The Chief Crops	9
WORK OF THE DEPARTMENT	12
Packing of Vegetables	12
Marketing Service	13
Advisory Service	13
Inspection and Regulatory Services	13
Horticulture	14
Office Work	15
The Agricultural Station	15
STAFF	16
FINANCIAL	17
Plant Pathological Report	18
General Review	18
Office and Advisory Work	18
Problems Investigated	18
Inspection Services	21
Spraying Service	21
Diseases and Pests Observed during the Year	21
Conclusion	23
Report of Agricultural Assistant	24
Field Tests	24
Inspection of Seed Potatoes	26
Marketing	27
Report of Inspector of Produce	32
Report of Government Veterinary Officer	35
Appendices—A. Exports of Vegetables and Bulbs 1916—1935	37
B. Rainfall at Station	38
C. Financial	38
D. Disposal of Produce	41
E. Licensed Veterinarians	42
F. Licensed Shippers of Produce	42

Board of Agriculture, 1935

Hon. G. S. PATTON, M.C.P., Chairman.
Wor. B. C. C. OUTERBRIDGE, J.P., M.C.P., Deputy-Chairman
Hon. W. J. H. TROTT, M.C.P.
Mr. E. J. MONIZ
Mr. W. S. COOPER, M.C.P.
Mr. J. H. HOLLIS
Mr. H. T. NORTH, M.C.P.
Mr. J. E. P. VESEY, M.C.P.
Mr. A. J. GORHAM

Department of Agriculture, 1935

Director of Agriculture (from 15th November), T. A. RUSSELL, B.Sc., A.R.C.S., A.I.C.T.A., Dip. Agr. (Cantab.)
Plant Pathologist and Acting Director (till 14th November), T. A. RUSSELL.
Agricultural Assistant, W. R. EVANS.
Horticulturist, (till 22nd May), J. C. NAUEN.
Inspector of Produce, T. ARTHUR HOLLIS.
Clerk, HILDA C. LINES.

PART-TIME OFFICERS.

Government Veterinary Officer, C. J. COOPER, V.S.
Assistant Inspector of Produce, C. V. S. EARLY.
Sub-Inspectors of Produce, E. G. WHITBREAD, A. W. B. FOWLE, E. L. ADAMS, J. W. M. GIBBONS, G. FOWLE.

LETTER OF TRANSMISSAL

Agricultural Station,
Paget East, Bermuda
28th April, 1936.

Sir,

I am directed by the Board of Agriculture to lay before His Excellency the Governor, for the information of the Legislature, the accompanying reports of the Department of Agriculture for the year ended 31st December, 1935.

I have the honour to be,

Sir,

Your obedient servant,

HILDA C. LINES,

Clerk, Board of Agriculture.

The Honourable,
The Colonial Secretary,
Hamilton.

Report of the Director of Agriculture, 1935

The Chairman,
Board of Agriculture.

I have the honour to submit reports of the Department of Agriculture for the year 1935.

AGRICULTURE IN 1935

The year under review showed improvement in several respects over the two preceding years. The weather was on the whole propitious, there being no winds of very destructive force and rainfall being sufficient during the greater part of the year. The only crop suffering from drought was the main tomato crop, the yield and duration of which were cut short by lack of rain. Yields of other vegetables were good, potatoes cropping especially well both as regards the spring crop of Chili Garnets and Irish Cobblers and the autumn crop of Bliss Triumphs. Perhaps the chief improvement however was in the average prices of export vegetables. In the case of every commodity except potatoes and celery the price was above the average for the past four years, and in the case of beets and onions was higher than in any one of these former years. While diseases and pests took their customary toll of the crops, the only exceptional damage was due to an epidemic of bacterial spotting of tomatoes in the main crop, to which further reference is made in the Plant Pathological report. No serious occurrence of disease amongst domestic animals has to be recorded.

The total returns to farmers for produce exported was estimated at £45,700 and the returns for produce sold locally roughly at £150,000, making a total rather less than £200,000.

The Export Markets. The quantities of vegetables and lily bulbs shipped to various countries during the shipping-season of 1935 are summarised in the following table, while in the larger table which is included as Appendix A, it is possible to compare the quantities exported during each year of the period 1916 to 1935.

Commodity	U.K.	Canada	B.W.I.	U.S.A.	Other Countries	Totals
Beets, bushels	—	1,510	—	—	—	1,510
Cabbage, "	—	8,914	—	—	718	9,632
Carrots, "	13	25,853	57	—	—	25,923
Celery, "	—	23,754	12	—	—	25,766
Cucumbers, "	—	542	—	—	—	542
Kale, "	—	—	—	6,024	—	6,024
Onions, "	—	9,128	237	—	—	9,365
Parsley, "	—	129	—	20	—	149
Potatoes, "	1,145	14,848	255	17,715	2,016	35,979
Spinach, "	—	343	—	—	—	343
Tomatoes, "	10	22,899	5	—	28	22,942
Miscellaneous	—	258	43	—	—	301
Totals, bushels	1,168	108,178	609	23,759	2,762	138,476
Lily bulbs, cases	334	127	2	1,948	79	2,490

The total volume of vegetables at 138,476 bushels compares with 143,194 bushels in 1934, a decrease of nearly five thousand bushels. This was due to falling exports of onions, reduced to the extent of nine thousand bushels, and potatoes, ten thousand less, the decline being only partially made up by an increase in the quantity of celery shipped by nearly ten thousand and of tomatoes by six thousand bushels. Other vegetables such as carrots, cabbage, and beets showed little change. There was a small increase in the number of lily bulbs exported.

If reference is made to Appendix A, it will be seen that in only one year (1931) during the past twenty years have the total vegetable exports been less in volume than they were in 1935. Indeed the volume exported in 1935 was only 51 per cent of the average volume exported during the previous ten years. The quantity of tomatoes shipped however was greatly in excess of the quantity shipped in any year of the twenty-year period.

In spite of the reduced volume of exports, the estimated return to the farmer from their sale showed a substantial increase over the corresponding values for the past two years.

The estimated returns to Bermuda from various countries, arrived at by subtracting freight-charges and selling costs from the gross sales, are as follows:

Exported to	
Canada	£35,200
United States of America	8,900
United Kingdom	900
British West Indies	100
Other Countries	600
	£45,700

The Canadian Market. A larger proportion of the vegetable exports went to Canada in 1935 than in any previous year, the volume of 108,178 bushels amounting to 78 per cent of the total volume exported. If the bushel is taken as the unit of quantity, the quantity shipped shows a small increase (four thousand bushels) over the figure for 1934 and an almost equal decrease from the figures for 1933. If however the container is taken as the unit, the quantity shipped shows a substantial increase over any other year.

The system of shipping exclusively to one broker in Saint John, N.B., one in Halifax, N.S., and two in Montreal was continued, and the orderly marketing which has resulted appears to be gaining tardy recognition. The brokers in Montreal handled the greater part of the produce and, for every six crates sold in Halifax and seven in Saint John, nearly twenty-one were sold in Montreal. It may be noted that the sale of each vegetable is not in this proportion, certain vegetables such as carrots and cabbage selling chiefly in the Maritimes, others such as potatoes almost entirely in Upper Canada. This point is brought out by figures included in the following table which shows the number of crates of each type of vegetable consigned to the three ports.

Commodity	Halifax	Saint John	Montreal	Total
Beets (crates)	663	589	258	1,510
Cabbage	2,235	1,695	527	4,457
Carrots	7,843	9,888	8,122	25,853
Celery	1,740	3,879	6,258	11,877
Cucumbers	108	150	284	542
Onions	2,435	3,220	3,473	9,128
Potatoes	77	365	14,406	14,848
Spinach	137	195	11	343
Tomatoes	8,729	8,661	51,307	68,697
Miscellaneous	111	125	340	576
Totals	24,078	28,767	84,986	127,831

A satisfactory feature of the Canadian market was the firmness of prices affecting every commodity except potatoes. The tomato crop sold at a lower price than in 1934, but through reduced costs for freight and marketing the return to the grower was little less than in that year. The average price per crate at which each major commodity sold is compared with corresponding prices during the four preceding years in the table which follows.

Commodity	1931	1932	1933	1934	1935
Beets, per crate	$1.48	$1.57	$1.57	$1.31	$1.72
Cabbage "	1.64	2.33	1.73	1.92	2.33
Carrots "	1.31	1.89	1.43	1.40	1.54
Celery "	2.98	2.74	1.90	2.40	2.33
Cucumbers "	—	2.39	1.91	1.80	2.00
Onions "	2.04	1.67	1.06	1.31	2.06
Potatoes "	1.94	1.86	1.75	1.62	1.47
Spinach "	—	1.55	.86	1.08	1.40
Tomatoes "	1.33	1.49	1.61	1.90	1.60

If the cost of crate, and charges for packing, ocean freight, any land freight, and brokers' commission are subtracted, it is possible to obtain some idea of the return to the farmer for produce selling at the prices quoted above in the column for 1935.

Commodity	Calculated Return to Farmer
Beets, per crate	4s. 5d.
Cabbage " "	4s. 5d.
Carrots " "	3s. 10d.
Celery " "	7s. 5½d.
Cucumbers " "	4s. 4½d.
Onions " "	5s. 11d.
Potatoes " "	3s. 4d.
Spinach " "	3s. 3½d.
Tomatoes " "	3s. 10d.

The facilities provided by the Canadian National Steamships for transport of vegetables were better than in previous seasons. Increased refrigerated space on ships of the Eastern Service, combined with the system whereby a definite volume of space could be reserved for shipments from Bermuda, enabled a more regular supply of vegetables to be shipped to the Maritime ports than was possible in former years.

The New York Market. Less produce was sold in the United States during the year under review than in any year of which we have record. The quantity of 23,759 bushels shipped in 1935 compares with 37,001 bushels in 1934. The only vegetables shipped to any extent were potatoes and kale, and the price was for the most part so poor that by the time duty and charges had been paid there was little profit left to the farmer.

A small improvement in the sale of Easter lily bulbs in the United States has to be recorded.

Other Export Markets. Small shipments of vegetables were made to England in order that expert opinion might be received on the possibility of selling fresh Bermuda vegetables during the winter and spring seasons. One of the chief obstacles to any trade of this kind is the poorness of steamship service, there being only occasional direct sailings and no refrigerated space suited to the carrying of perishable vegetables. Crates of carrots and tomatoes sent in ordinary stowage have rarely arrived in sound condition, and until means of packing and transport are improved they seem hardly worth considering.

Results with new potatoes have been more encouraging, but it appears that none of the varieties which we grow for the American markets possesses the particular qualities which the English public expects and demands in new potatoes. The variety Katahdin approaches more nearly the type required than any other variety we grow, and fair prices have been obtained for small shipments, an average figure being about 8/- per one-bushel-crate. Irish Cobblers appear to resemble too closely the stored domestic crop to fetch a good price as new potatoes, and there is no demand for red-skinned varieties. To sum up the situation, it would seem that highest prices are only to be obtained by a variety that to the consumer has the typical appearance and flavour of the new potato to which he is accustomed, and owing to the heavy freight-rate and charges anything lower than the highest price is unlikely to benefit the grower in Bermuda.

During June and July more than two thousand bushels of Garnet potatoes were shipped to British Guiana and they returned fair prices. Earlier in the season a small quantity of cabbage was sold there profitably.

The Domestic Market. The value of vegetable produce sold locally is roughly calculated to be more than three times the value of produce exported, and growers appear to be gaining a greater realisation of the value of the domestic market. The stalls in the Farmers' Market are seldom without tenants for long, and the peddling of vegetables on the roads has increased noticeably in the last two or three years. As this peddling is entirely unregulated, it is not possible to gain any clear idea of the volume or value of the produce turned over in this way. It is hoped that the availability of fresh vegetables is promoting their extended use and a greater appreciation of their valuable properties as foodstuffs. While there is this improvement in means of supply to the housewife, there still appears to be a lack of co-ordination between grower and hotel-keeper. The formation of some sort of wholesale vegetable market, advocated in the Report of the Acting Director for 1934, where shop-keepers and hotel-stewards could obtain large supplies at prices lower than the retail would seem to merit

consideration. While various proposals have been under consideration for providing refrigerated space suited to the storage of vegetables, little progress has been made towards obtaining it.

The Chief Crops. While a larger quantity of potatoes than of any other vegetable was grown, this crop suffered a significant decline in importance as an export commodity. The tomato crop on the other hand strengthened its position as the most important export vegetable. Those of next importance were carrots and celery followed at some distance by cabbage and onions.

Tomatoes. A larger area was planted to the main crop of tomatoes than in the previous year, but the early shipments in May were small owing to backwardness of the crop through lack of sunshine. The weather indeed was unusually overcast and wet during May but improved in June, and heavy shipments were made throughout this month reaching a maximum of 13,723 crates by S/S Lady Hawkins on 13th followed by 10,127 by S/S Lady Somers on 19th June. These quantities would have been larger but for the occurrence of a severe epidemic of bacterial spotting in some fields, particularly in the parish of Southampton, which resulted in a portion of the crop being thrown away. Towards the end of June the weather became so dry that the crop suffered from lack of moisture, and there was a sharp decline in the shipments early in July.

Almost all of the crates shipped (98.3 per cent) were filled at the two Government Packing-houses on the Station grounds. The quality of the fruit, and as a result the selling-price in Canada, was on the whole inferior to that of former years, largely in consequence of the incidence of bacterial spotting which occurred so abundantly that it proved impracticable to reject all fruit showing slight superficial blemish. The only varieties grown were Bonny Best and Break O'Day.

Potatoes. The spring crop of Chili Garnets and Irish Cobblers had favourable weather for growth and suffered only to slight extent from blight, and as a result good yields were dug. Great difficulty was experienced in disposing of them. In Canada an unusually large crop had successfully survived the winter and was still selling at low prices. Accordingly the red potatoes, which are only tolerated at the best of times, could hardly be sold. Some indeed after spending some weeks in cold storage in Canada were returned to be sold in Bermuda towards the end of the summer. White potatoes shipped up to Canada were all sold there, with the exception of a thousand crates of No. 2 size and farm-packed potatoes which were sent on to Liverpool, but except for those which were shipped early, they returned little profit to the grower.

Most of the Bliss Triumph seed was obtained from Nova Scotia, 2,503 barrels being imported from there as against 195 from Long Island. Seed from both sources was of excellent quality. The crop was fortunately not exposed to high winds till about the middle of December by which time most of the potatoes were nearly mature. As a result very good yields were obtained on many farms. Once again the grower's great problem has been to find a profitable outlet for his crop.

Carrots. Exports of carrots to Canada have remained remarkably steady during the last three seasons, varying from 26,005 bushels in 1933, to 24,409 in 1934, and 25,853 in 1935. The price has varied rather more, and the average price of $1.54 per bushel crate last season showed considerable improvement over the average prices for the two preceding years.

Celery. The celery crop in most areas suffered little from blight until towards the end of the season, and much of it was above the average quality, while from some fields exceptionally fine celery was cut. The quantity exported, amounting to 25,766 bushels, showed a gain of ten thousand bushels over that of the previous year.

Onions. The onion crop presented a striking example of the unpredictable in farming. The area planted was the least for several years and following severe thrips attack the yield was small and of poor quality. But thanks to crop failures in other supplying countries, there was excellent demand for onions in Canada at the time when the Bermuda crop was ready, and all was sold without difficulty and brought a good return to the growers. While a greater quantity could have been sold than was available, the demand during the past season must be regarded as abnormal, and on the basis of the sales during the past few years no great increase in the area of this crop seems justified at the present time.

Easter Lilies (L. longiflorum var. eximium: trade name L. Harrisii). The condition of the lily bulb industry has shown slow but steady improvement since 1933. In that year the sales reached their lowest ebb, and in the following planting-season the area planted fell to its lowest level since the resuscitation of the industry about the year 1923. Both sales and area planted have increased by a small amount each year since 1933, and it is believed that the industry only awaits the slowly returning prosperity in other countries, and particularly in the United States, to come again into its own. The following table shows the number of cases of lily bulbs exported in the past five years.

Year	Exports
1931	4,270 cases
1932	3,009 "
1933	2,014 "
1934	2,309 "
1935	2,490 "

The greatest quantity exported in post-war years was 7,611 cases in 1928, and the quantity shipped in 1935 barely reached one-third of this amount. The area planted to lilies has followed closely the volume of the sales as shown by the figures given below.

Year	No. of Growers	Area in Acres
1931	156	56.2
1932	107	44.0
1933	70	33.0
1934	61	20.2
1935	51	24.3

The area planted in the autumn of 1935 for the 1936 crop is estimated at 26.8 acres, thus showing a further small increase.

The 1935 crop had a favourable season for growth. The only trouble of any importance was the virus disease yellow flat or rosette, whose presence in many fields necessitated constant attention on the part of the growers. As usual, all fields were inspected at least twice during the growing season by the Department, to ensure that plants affected by this disease were removed, and certificates permitting the sale of the bulbs were granted only to those growers whose fields satisfied the requirements of the Department with respect to disease. An exceptionally fine crop of bulbs was dug.

There was an increase in the sale of bulbs to the United States of America from 1,674 cases in 1934 to 1,948 in 1935, and to Canada from 64 to 127. Sales to European countries suffered a decline, partly the result of instability and difficulties of exchange in some lands, and partly through the loss of a substantial Swedish order. This followed a failure of Bermuda bulbs of the previous crop in Sweden, due either to faulty methods of growing or to unsuitability of conditions for their growth in such northern latitudes. In the hope of settling the question and if possible of retaining Swedish interest in Bermuda bulbs, a supply of bulbs was sent to Sweden in September, at the joint expense of the growers, the Department and the agents, Messrs. Robert Tucker & Co., with instructions as to the proper method of growing them. Messrs. Robert Tucker & Co. continued their active supervision of sales in the United Kingdom, and the following extracts from their report describe the situation there.

"In Great Britain the sales were almost exactly the same, 287 cases compared with 286 cases in 1934. This is not a very large number for a country of this importance, but it must be remembered that the Harrisii, at anything like an economic price, does not attract a large section of the Trade. In all the circumstances, the maintenance of a steady trade amongst a reliable circle of customers can be regarded as satisfactory. We are confident that a return of prosperity would be reflected in a noticeable increase in our sales.

There was no material change in the prices realised. In our last report, the hope was expressed that Japanese prices would continue to rise, which would help the trade by lessening the disparity between the values of Bermudian and Japanese bulbs. The hope has not been realised, despite a further reduction in the shipments from the East, and the prices of Japanese bulbs at auction have been little, if any, higher than in 1934. We do not know the reason, but a possible explanation may be found in the poor prices realised at market for the flowers during most of the past twelve months.

The exhibition of Bermuda lilies in Hyde Park and at Kew Gardens maintained their usual standard. They were, in fact, better than in 1934, in which year the droughty conditions imposed great difficulties. A departure was made from the usual practice of having plants shown at the Royal Horticultural Society's Hall. The Jubilee celebrations offered a chance of bringing them to the notice of a much larger number of the public, and it was arranged that Messrs. James Carter and Co., should display a succession of plants during the week in the window of their premises in Regent Street. It was a most attractive exhibit, and attracted much attention. The plants were particularly fine, and it is of interest to record that the skill of their cultivator resulted in obtaining 100 perfect plants from exactly 100 bulbs.

The appearance of the bulbs this season was particularly fresh and pleasing, which we are inclined to attribute to the unusually short interval of time between reaping and shipping. Most of the growers managed to despatch on 10th July, and their promptness was much appreciated by customers.

(sgd.) Robert Tucker & Co."

London, 20th November, 1935.

Animal Products. The only meat produced locally to any extent is pork and veal. The number of pigs in the Colony has been greatly reduced in the past two or three years but appears to be on the increase again.

The supply of Bermuda eggs is seasonal, for they are to be had in quantity during several months of the year and are hardly obtainable at any price during other months. With care given to feeding and to the timely maturing of pullets, it should prove possible to have a more even supply throughout the year.

An animal product which has been largely neglected is honey, and there seems no reason why bee-keeping should not be greatly developed.

WORK OF THE DEPARTMENT

The year under review was one of great difficulty for the Department through shortage of staff. The post of Director was vacant on the first day of the year, and from the third week in May, the Department was also without a Horticulturist, so that for much of the year two posts were vacant. At the same time the demands on the Department were in no way reduced, so that it was left to the remaining members of the staff to take over what extra work they could.

The main activities of the Department are outlined in the following pages.

Packing of Vegetables. The Packing-House at the Station was open throughout the shipping-season for the packing of growers' vegetables, and the supplementary shed at Evans Bay, Southampton, was open for part of April, May, and part of June. The second tomato-shed at the Station was used during the last week in May, all of June, and the first week in July. Packing proceeded smoothly on the whole, and the only nightwork necessary at Paget occurred at the height of the tomato season. Through difficulties in obtaining suitable labour in the daytime at Southampton, more nightwork was done there. A lean-to extension, which was built on to the packing-shed at Evans Bay, proved of advantage in the handling of produce there.

Excluding crates of celery all of which were filled in the fields, 86 per cent of the crates of vegetables shipped to Canada were packed in the Government packing-houses. The actual number of crates was 108,938, and this is the largest quantity which has been handled by the Department in any year. The ratio of Government-packed to farm-packed produce was also larger than in any previous year, indicating that most growers appreciate the benefits of Government-packing and are inclined to make greater use of them. This is expressed more clearly in the following table.

Year	No. of crates packed by Department	Proportion of vegetables (exclusive of celery) packed by Department
1932	54,613	59%
1933	92,247	80
1934	103,541	82
1935	108,938	86

The cost of Government-packing was not covered by the charges made to the grower, but the proportion paid by Government was smaller than in any previous year. Thus of an appropriation of £4,000 for packing, the sum of £3,934 was expended, while the sum of £3,066 was reimbursed to the Treasury as charges paid for crates and packing. The crate material and other supplies carried over at the end of the season were approximately equivalent in value to those brought over at the beginning of the season from the previous year, so that the net cost to Government may be placed at approximately £900.

The charges made to growers amounted to sixpence for every crate of cabbage packed, fivepence per crate for carrots and tomatoes, threepence for onions and potatoes, and fourpence for beets and other vegetables. The grower was also charged the cost price of the crate plus twopence to cover cartage of crate material, cost of nails and of making the crate. Vegetables packed at the Southampton Packing-House were conveyed by rail to the dock, and the grower and the Department each contributed half the freight-charge.

Marketing Service. During the main part of the shipping season the Agricultural Assistant was stationed in Canada where he supervised the placing and disposal of Bermuda produce. This work is described more fully in the Assistant's report.

The Department kept closely in touch with each of the official brokers and so was able to inform growers and shippers of prevailing prices and advise them as to the most promising allocation of shipments to the several ports.

Advisory Service. In addition to advising on the marketing of produce, members of the Department gave advice on the cultivation of crops, the time for planting, varieties worth growing, and the control of diseases and pests.

Inspection and Regulatory Services. The Department was responsible for the administration of certain Byelaws covering the following services.

(i) Control of Animal Diseases. The Government Veterinary Officer examined all domestic animals landed in the Colony with a view to checking the introduction of serious disease. As shown in his report, the number of live stock imported during the year was greater than during the preceding year, except in the case of dairy cattle and pigs. In view of the occurrence of rabies in dogs in Pennsylvania and Massachusetts, special precautions were taken with regard to the importation of dogs from the United States during part of the year.

An amendment of the Bye-laws regulating the importation of animals, which has been recommended by the Board of Health and Board of Agriculture, reads as follows:

> Every dairy animal imported into or landed in these Islands shall be accompanied by a certificate issued by a competent authority to the effect that it has passed a negative test for Contagious Abortion (Bang's Disease). Any dairy animal landed without such certificate shall be segregated immediately by the Veterinary Officer, and shall be tested for Contagious Abortion, and if reacting to the test the animal shall be slaughtered, no compensation being payable to the owner.

In continuation of the joint scheme of the Board of Health and Board of Agriculture for the control of bovine tuberculosis, the Government Veterinary Officer tested cattle throughout the Colony for this disease. The test, which is made annually free of charge, is compulsory in the case of cows supplying milk for sale and is voluntarily taken advantage of by many private owners of cows, so that the cattle tested, numbering 1,470 in 1935, represent a very high proportion of the cattle in these islands. The few which reacted positively to the test were slaughtered, compensation being paid by the Government.

(ii) Control of Plant Diseases and Pests. Plants imported into the Colony and arriving at the dock as passenger's baggage or as freight

or at the Post Office in the mail-bags were examined and treated where it was considered desirable for the exclusion of foreign diseases and pests. This service of inspecting imported plants becomes increasingly onerous each year as the importations gain in number, and, since the signs of many diseases and pests are minute and are only to be recognised by a trained eye, it can only with safety be done by a fully qualified plant pathologist. Amendments to the Byelaws are under consideration, which it is hoped will improve the efficiency of this service.

Work done in connection with plant diseases and pests already present in the Colony is described in the Plant Pathological report.

(iii) Inspection of Produce and of Nursery Stock. Vegetables for export were subjected to inspection, those packed by Government at the packing-sheds, and those packed on the farms at the docks, and any in which serious defect was found were condemned. The most common defects are described in the reports of the Agricultural Assistant and the Inspector of Produce.

In addition to the inspection of lily fields made by the Plant Pathologist, an inspection of the bulbs at the time of packing was made by the Inspector of Produce. Other plants and bulbs intended for export were examined shortly before shipment, and only such as were found to be free from diseases and pests were passed as fit for shipment.

(iv) Inspection of Seed Potatoes. For the first time for many years, no inspection of Bliss Triumph seed growing in Long Island was made by the Department, owing in part to the fact that no member of the Department could be spared at the right time and still more to the fact that the anticipated requirements of Long Island seed were not sufficiently great to justify the expense of a special inspection. As it turned out, only 195 barrels of Long Island seed were imported, all of which was of excellent quality.

Nova Scotia provided the greater part of the Bliss Triumph seed as well as all the Irish Cobbler, Chili Garnet and Katahdin seed. Fields in which this seed was being grown were inspected by the Agricultural Assistant during his stay in Canada on marketing business.

Seed potatoes were inspected on arrival at the dock by the Inspector of Produce as described in his report.

Horticulture. A large number of plants was supplied to Arbor Societies for roadside-planting in various parishes, to schools, and to bazaars in aid of charitable funds. Plants not ordinarily obtainable from florists in Bermuda were sold at a low price to private persons. Assistance was given whenever possible to the Garden Clubs, the Horticulturist acting as Honorary Secretary of the Bermuda Garden Club till his departure, and both Horticulturist and Director addressing the Garden Clubs of Bermuda and of Sandys Parish on several occasions. A small exhibit was staged by the Department at the Flower Show at Somerset on 2nd May, illustrating some interesting flower-plants of recent introduction and the nature and control of the palmetto scale. At this show the Acting Director and the Horticulturist acted as judges of vegetables and flowers respectively.

It is regretted that, following the decision which has been made to dispense with the services of a Horticulturist, the assistance given in the past to Arbor Societies and Garden Clubs must of necessity be reduced, and the introduction and propagation of new and interesting plants for the garden, which has been a valuable feature of his work, must be abandoned.

Office Work. Although it is nevertheless of the first importance, the work in the office hardly lends itself to descriptive report. The clerical work; involving correspondence on agricultural and departmental affairs, the keeping of financial accounts, and the keeping of records in connection with Government-packing, was performed efficiently. Letters received during the year numbered 976, and those despatched 1,348.

The Agricultural Bulletin which completed its fourteenth year in 1935 was issued each month, and was distributed not only in the Colony but to Departments of Agriculture and other institutions in many countries.

A large number of publications was received from departments of agriculture and colleges in many parts of the world, and this opportunity is taken gratefully to acknowledge them.

The Agricultural Station. The grounds were kept tidy and as attractive as possible. The roads were maintained in good order and the office-yard resurfaced for which purpose prison-labour was largely used.

The buildings were kept in good repair, and all were painted externally by the Department of Public Works. One of the glasshouses was converted into another slat-house, and the remaining glasshouses were patched up.

(i) Vegetable Plots. The vegetable plots were cropped twice, in the spring and in the autumn, and most were planted in the summer to soybeans which were ploughed in as green manure. Farmyard manure was applied to the plots in some cases before and in other cases after the soybean crop.

In the following table are indicated the crops which were grown and the experimental work for which they were used, the letter "v" indicating a test of varieties, "f" a fertiliser test, and "p" work in the control of disease or pest.

	Spring	Summer	Autumn
North Field Plot 1	Tomatoes v.p.	Soybeans	Miscellaneous vegetables v.
Plot 2	potatoes, cabbage p.	"	tomatoes v.p.
South Field Plot 1	potatoes (white) p.	"	potatoes f. (Triumph)
Plot 2	carrots f.	"	potatoes (Katahdin)
Plot 3	onions p.	"	carrots
Rosebank	cabbage, potatoes v.p.	corn (forage) groundnuts	tomatoes etc. v.

The crops were used either for experimental shipments or for supplying government institutions, such as the gaol and the hospital. Part of the groundnuts was sold in the Farmers' Market at a retail price of sixpence per lb. in the shell, there being no other Bermuda-grown nuts available.

(ii) Ornamental Plots. The flower-plots were kept planted with decorative plants. Beds in front of the Office, filled with mixed annuals, were especially full of colour and attracted much attention during spring

and early summer. Flowering trees which blossomed well included a Spathodea near the main entrance and a yellow Cassia below the Director's house, the latter being covered with blossom during November and December. A few trees and shrubs of special interest were marked with descriptive labels of a type recommended by the Curator of the Cambridge University Botanic Garden.

The South Orchard which had fallen into despair was cleaned up, the citrus trees were sternly pruned and a few young trees were planted.

(iii) Live Stock. The disposal of most of the live stock in 1934 left only two cows, both unfit for milk production, the old cow Juliet of Montrose and the imported cow Amazon of Ware. These have been allowed to graze throughout the year and have supplied a certain amount of manure. The heifer Jane of Montrose was returned as unsatisfactory by the authorities of the Lunatic Asylum to whom she had been lent, and has since been bred successfully.

(iv) Visitors, etc. A large number of visitors came to the Station, and many showed interest in the experimental work being done and in the collection of plants. A small handbook or leaflet describing the plants of outstanding interest and indicating where they might be found would render the gardens of much greater value to visitors, and it is proposed to compile something of this nature as time permits.

Distinguished visitors to the Station included His Excellency the Acting Governor, the Hon. E. J. Waddington, C.M.G., O.B.E.; Miss M. Newton, Senior Plant Pathologist, Dominion Rust Research Laboratory; Mr. Lawrence Dodge, Farm Economics Branch, U. S. Department of Agriculture; Dr. Hodgson, an expert on Hay Fever from New York; Dr. Beebe, Dr. Tee Van, Miss Hollister, from the New York Zoological Society; Mr. Burn, London Office of Trade Development Board, and Mrs. Burn; and many others.

The Exhibition grounds were lent to the Military Command for a Horse Show and Gymkhana which was held on 21st March.

STAFF.

Mr. T. A. Russell, Plant Pathologist, acted as Director of Agriculture from 1st January 1935, and was appointed Director as from 15th November.

Mr. W. R. Evans, Agricultural Assistant, was absent from the Colony on duties connected with the marketing of vegetables in Canada from 9th April to 31st July. Mr. Evans was on vacation leave in Bermuda from 21st January to 9th February.

Mr. T. A. Hollis, Inspector of Produce, was on vacation leave in Bermuda from 3rd to 24th September.

Mr. J. C. Nauen, Horticulturist, went on vacation leave on 22nd May prior to resigning from the Department to take up the appointment of Assistant Curator of the Botanic Gardens, Singapore, F.M.S. Mr. Nauen joined the Department in 1928, and during his period of service he did much to encourage horticulture in the Colony. His services were ever at the disposal of Garden Clubs and Arbor Societies, and he was responsible for the introduction of a number of plants to beautify Bermuda's gardens.

Miss Hilda Lines, in addition to her duties as Clerk to the Director and to the Board, had much extra clerical work to do during the shipping-season in connection with the packing of vegetables by Government.

Dr. C. J. Cooper, Government Veterinary Officer, obtained leave to travel to New York on vacation from 20th to 30th November. During his absence his duties were performed by Dr. J. W. Sutherland.

Mr. C. V. S. Early, Station Foreman, continued to act as Assistant Inspector of Produce during the shipping-season. It is of interest to note in the Silver Jubilee Year of H. M. King George V's reign that Mr. Early entered on his twenty-fifth year of service with the Department.

Messrs. E. G. Whitbread, A. W. Fowle, E. L. Adams, J. W. M. Gibbons and G. Fowle acted as Sub-Inspectors when required at the Packing-houses and docks. Mr. Whitbread rendered valuable service not only in connection with Government-packing but in the wider field of marketing to which he applied a keen mind and sound judgment, and with his removal to Jamaica the Department loses a most able officer.

FINANCIAL.

The expenditure of £3,843 in Personal Emoluments was authorised by the Appropriation Act of 1934, and of this sum £2,966. 12. 1. was expended. The sum of £6,720 was appropriated for other purposes by the Appropriation Act of 1934 and by Supplementary Grant No. 23 of 1935, and £6,570. 16. 10. was used. Reimbursements made to the Treasury for charges made for packing vegetables and for the sale of vegetables and plants amounted to £3,163. 18. 11. The nett expenditure of the Department, exclusive of Personal Emoluments, was therefore £3,406. 17. 11. As will be seen from the table which follows, this is less than was expended in any of the past ten years, and indeed represents the smallest nett expenditure in any year since 1920.

Year	Gross Expenditure	Reimbursements	Nett Expenditure
1926	£ 4,999 6 5	£ 207 8 9	£4,791 17 8
1927	4,409 19 5	346 2 4	4,063 17 1
1928	4,038 12 7	157 10 8	3,881 1 11
1929	4,184 6 10	193 0 1	3,991 6 9
1930	6,500 16 2	247 18 9	6,252 17 5
1931	6,984 18 9	280 1 1	6,704 17 8
1932	6,745 2 4	466 7 1	6,278 15 3
1933	10,191 17 0	2,434 9 7	7,757 7 5
1934	9,905 10 11	2,409 6 9	7,496 4 2
1935	6,570 16 10	3,163 18 11	3,406 17 11

When it is borne in mind that out of the gross expenditure of £6,571, the sum of £3,934 went towards Government-packing, a service that was not contemplated in 1926, it will be realised how drastically the expenditure on general agriculture, including educative and experimental work, has been curtailed during the past ten years.

Apart from departmental votes, additional financial assistance was given by the Government to agriculture by the payment of a subsidy from votes of the Trade Development Board to provide increased facilities for the shipment of vegetables.

Respectfully submitted,

T. A. RUSSELL,

Drector of Agriculture.

4th March, 1936.

Plant Pathological Report, 1935.

The Chairman,
Board of Agriculture.

I have the honour to present a report on the diseases and pests of plants occurring during the year 1935 and on the work done in their control.

GENERAL REVIEW.

The year under review saw the occurrence of a severe epidemic of bacterial spot on tomatoes, a disease which, though not entirely new, since the characteristic spots had been seen in previous seasons, was for the first time a serious cause of loss in the Bermudian tomato-crop. Apart from this trouble, the year might be considered a normal one as regards the incidence of disease in crops. Indeed Phytophthora blight caused rather less damage than usual to the spring potato crop, and Septoria blight of celery was considerably less than in recent years.

A notorious insect pest recorded from Bermuda for the first time was the grapevine Phylloxera, **P. vitifoliae** Fitch, but this pest, though dreaded in some countries of the world, is not expected to be of any importance in this Colony where grapes are not grown commercially. The onion crop as usual was badly damaged by the thrips **T. tabaci,** while the abnormally large quantities of potatoes which were held unsold over the summer, encouraged attack by the tuber-moth, **Phthorimaea operculella.**

Unfortunately the time given to plant pathology was drastically curtailed by the press of other duties which had to be done as a result of vacancies in the staff of the Department. While the advisory and inspection services were maintained as fully as possible, research and experimental work had almost to be abandoned. Some study however was given to diseases and pests of the tomato crop, and to those of the Bermuda cedar, and the distribution of parasites for the control of the palmetto scale was continued vigorously.

OFFICE AND ADVISORY WORK.

The office work done included correspondence and the keeping of records on plant pathological matters. The laboratory equipment was maintained in good order. With the assistance of Mr. Jack Osborn of Warwick Academy, the collection of Bermudian insects was re-arranged and renovated, and the re-arrangement of the pathological library was completed.

Advice was given to growers on the control of diseases and pests of crops, and also to gardeners in connection with the growing of flower-plants and fruit-trees. Information was also given regarding domestic and warehouse pests. The control of diseases and pests attacking crops and ornamental plants on the Station grounds was supervised.

PROBLEMS INVESTIGATED.

Palmetto Scale. The situation with regard to the scale on palmettos **(Comstockiella sabalis)** has shown steady improvement during the year. The distribution of the two parasites, **Physcus sp.** and **Encarsia portoricensis,** has borne successful results and has been actively continued. Many palmettos which were badly infested at the time the parasites were applied now show complete recovery. The chief trouble has been experienced with palmettos in exposed windy places where the parasites seem to find difficulty in multiplying rapidly. Under sheltered conditions, on the other hand, the control which they exercise is comparatively speedy.

In connection with the outbreak of scale in Somerset, valuable help was given by members of the Garden Club of Sandys Parish who made a thorough survey of the palmettos in the district, noting those that were infested with scale.

Diseases and Pests of Tomatoes. The survey of diseases and pests of the tomato crop which was started in 1932 has been completed and the results written up in the form of a scientific paper which has been accepted for publication in "Tropical Agriculture".

The chief progress made during the past year was in the study of the injury previously known as scab-spot, now identified as bacterial spotting due to **Bacterium vesicatorium**, Doidge. The symptoms of attack, consisting of small dark spots on the surface of the fruit, were noticed in former seasons, but no pathogenic bacteria were successfully isolated, and the damage was attributed to the feeding of some kind of insect. As a result of further investigation during the early summer of 1935 however, a bacterium was isolated which proved to be highly pathogenic. Young tomato fruits wiped with a piece of cotton wool which had been dipped in an aqueous suspension of the bacterium, developed prominent scabby spots after ten or twelve days, from which the bacterium was re-isolated without difficulty and used successfully to inoculate other tomato fruits.

Favoured by unusually cloudy and wet weather during the early growth of the main crop of tomatoes, this bacterial disease spread tremendously in a number of fields particularly in the parish of Southampton. Few fields were entirely free from it while, in some, so high a proportion of the fruit was blemished that picking was soon abandoned as a waste of effort.

The occurrence of a spell of dry weather in June rapidly reduced the incidence of this disease, indicating its susceptibility to conditions of weather. In a season of more normal weather indeed this disease is unlikely to prove so serious a trouble, but seed-treatment would appear advisable as a precaution lest the season turn out favourable to the disease.

Diseases and Pests of the Bermuda Cedar, Juniperus bermudiana. Early in the year a rumour circulated to the effect that the native cedar was attacked by some fatal disease and, the attention of owners of cedars being thus drawn to the condition of their trees, various defects which would otherwise have remained unobserved or been considered unworthy of notice were reported to the Department. The occasion was taken to make a brief survey of the diseases and pests of the Bermuda cedar, and a preliminary list was published in the December number of the Agricultural Bulletin. Cedars in some areas were found in bad state and some even were found to have been killed, but their poor condition was associated with poverty of soil, exposure to weather, or over-crowding of the trees themselves and of competing vegetation, rather than with any one pathogenic organism. While several fungi, insects, and mites do attack cedars, none appears to be sufficiently harmful on its own to cause extensive damage.

The cedar rust, **Gymnosporangium bermudianum** (Farl.) Earle, commonly forms its reddish-brown galls on the twigs, and when present in quantity on a tree it may cause some damage through death of those portions of the twigs distal to the gall. Other fungi very common on the dead scales clothing the larger twigs are a species of **Phomopsis** and a species of **Pestalozzia**, believed to be **P. funerea**, Desm, but neither seems to be actively parasitic.

The cedar scale **Chrysomphalus agavis** is widely distributed over Bermuda, and its small conical shell, dark-brown or black in colour, can

readily be seen on the needles. When abundant, the scale may lead to yellowing or browning of the needles and twigs. Three bugs occur in great numbers, the Singer **Cicada bermudiana** Verrill, the Grey Hopper **Ormenis sp.** and the Green-bug **Banasa euchlora** Stal., but no evidence has been secured that any of them causes significant damage. The boring-beetle, **Oeme linearis** Harris, invades wounds in the trunk or branches, the larvae making characteristic tunnels close under the bark.

Two types of mite have been taken on cedars. One, a species of **Eriophyes**, forms at the tip of the twig a small club-shaped swelling which usually bends at right-angles to the rest of the twig. The other, resembling a small red-spider, has been found only once, swarming in great numbers over the foliage on which it appeared to be feeding.

The only instance in which vigorous trees showed conspicuous injury occurred at the Agricultural Station, where the topmost spike of several tall cedars died back for a distance of two of three feet. This trouble appeared suddenly and did not spread further, and its cause remains unexplained.

Mediterranean Fruit-fly. Recordings of the occurrence of **Ceratitis capitata** were continued during the year, but the fly was scarce and for several months was not seen at all. The larvae were found more commonly in sweet peppers (**Capsicum frutescens**) than in any other fruit, and, although this crop is not grown in any great quantity, the fact that it may bear fruit throughout the year suggests that it is of importance in enabling the fly to survive the difficult seasons when other fruit is lacking.

The parasite **Opius humilis** was again recovered from larvae infesting peppers, on this occasion from Warwick Parish.

A trapping test, designed to prove the value of the material "Clensel" compared with a bran, borax, and sodium arsenate mixture as a bait for the fruit-fly, was started but had to be abandoned owing to scarcity of the fly.

Tests of Fungicides and Insecticides. The Sherwin-Williams spray, Basic Copper Sulphate, was used at a strength of 2 lbs. to 40 Imp. gallons of water without a spreader on Irish Cobbler and Katahdin potatoes for the control of Phytophthora blight. Part of the same field was treated with copper-lime dust, and another smaller part was left untreated in order to test for the presence of blight infection. The treatments were applied as soon as the potatoes were well above the ground and thereafter fortnightly. Ten weeks after planting, the unsprayed plots had been burnt up by blight while both sprayed and dusted areas were still green and only slightly touched by the disease.

Two dusts containing derris, Cooper's Drymac and Sherwin-Williams' Rotodust, were tried on cabbages against the looper **Autographa brassicae.** Three applications were made and a significant degree of control was given by both dusts. Possibly as a result of wet weather, damage by the caterpillar was unusually light even in the untreated rows, so that it is doubtful if the expense of dusting on a commercial scale would have been justified.

An attempt was made to control thrips on onions by applying nicotine dust, by spraying with Paris green, 1 oz. to 3 galls of water to which molasses was added, and by sprinkling naphthalene flakes along the rows. No treatment gave good control, and the Paris Green spray burned the plants.

INSPECTION SERVICES.

Inspection of Lily Fields. A first inspection of lily fields was made between 7th and 21st January, and a second, started on 18th March, was completed early in April. Those fields which were not up to the required standard of health at the time of the second inspection were visited a third time in May.

The fields certified as up to standard numbered 79 with a total area of 3,550 square rods, an increase of 300 square rods over the area in the preceding year. A few fields were condemned on account of yellow flat or rosette disease.

Inspection of Plant Importations. Each succeeding year sees an increase in the quantity of plants imported, and in 1935 consignments inspected on arrival at the Post Office and docks numbered 300. Pests found on these importations included aphides and snails from England, scale insects from Belgium, thrips from Holland, scale insects and mealy bugs from the West Indies, and scale insects, mealy bugs, aphides, and mites from the United States of America. Plants found infested with these were fumigated or otherwise treated to destroy the pests. A consignment of chives plants from the United States infested with larvae of the black onion fly, **Tritoxa flexa,** was confiscated and destroyed. Gladiolus corms imported from Canada were found to be carrying the thrips **Taeniothrips simplex,** and they were treated with hot-water before being passed. Various plants and plant products imported contrary to regulation, such as bulbs of **Lilium** and Narcissus, citrus plants from the West Indies, and carrots and sweet potatoes from the United States of America, were destroyed or returned to the country of origin by arrangement with the importer.

Inspection of Seed. Celery seed imported for sale was examined for the presence of **Septoria apii.** In samples of Golden Self-blanching seed obtained from Messrs. Clause, France, several counts showed on an average one seed in a hundred to be bearing pycnidia of the fungus.

SPRAYING SERVICE.

The two power-sprayers were kept in such good condition as their age permitted, and they were hired out by the day or half-day to growers who required them. They were employed during 125 days, being used especially on the potato, tomato, and celery crops, and occasionally on ornamental trees and shrubs.

DISEASES AND PESTS OBSERVED DURING THE YEAR.

On Vegetables.

Beets. Beets planted in the autumn were destroyed as usual by the fireworm **Hymenia fascialis.**

Carrots. Examination of carrots growing at the Station in January showed that some of the tops, and in particular the withered outside leaves, were rotted by **Sclerotinia sclerotiorum.** The roots when dug appeared to be quite sound, but when they were kept for a few days the fungus spread into them either through the crown or from rotted leaves in contact with the roots. No instance of infection of the roots directly through the soil was noticed.

Celery. A small lot of celery placed in storage at 36° F. in June rapidly wasted from rotting by **Sclerotinia sclerotiorum.** This fungus can grow at such a temperature, so that care is necessary to ensure that celery to be placed in cool storage is free from the fungus.

Onions. Attack by **Thrips tabaci** was severe.

Potatoes. Most of the imported seed was infected to very small extent with virus diseases, so that loss on this account was insignificant. Blight attack was not very heavy on the Irish Cobblers and Garnets, and accordingly the tuber-rot, also caused by **Phytophthora infestans,** which commonly follows blight was not generally troublesome.

The tuber-worm **Phthorimaea operculella** was not seen till near the end of the shipping-season when two lots brought to the Packing-house were turned down as unfit for shipment because of its presence. During the summer however it was destructive to stored potatoes. The common ant **Pheidole megacephala** was found abundantly amongst infested potatoes, apparently preying on the larvae of the pest.

Tomatoes. The occurrence of bacterial spot **(Bacterium vesicatorium)** on the main crop of tomatoes, which has already been described in this report, caused more loss than any other disease or pest. Burrowing of the fruit by larvae of **Phthorimaea operculella,** though frequently seen, was less common than in previous seasons.

On Other Plants.

Easter Lilies. The diseases of chief importance were rosette disease (or yellow flat) due to virus, and stump-rot caused by **Phytophthora parasitica.** The disease locally known as "twist" and the nutritional disorder involving chlorosis were also seen in some fields, but little progress was made in their elucidation.

Citrus. The white fly **Dialeurodes citrifolii** was troublesome on citrus trees during the summer months. The fruiting of lime trees in some areas was impaired by attack of the fungus **Gloeosporium limetticolum.**

Grape-vine. Deformed leaves from a grape-vine, which were sent to the Station in order that the trouble might be diagnosed, were found to be bearing galls of the Phylloxera **P. vitifoliae.** This appears to be the first recorded occurrence of this insect in Bermuda. It occurred on a Bermudian vine planted in the place where a vine imported from America had died. The owner agreed to dig up and burn the affected vine, and no other occurrence of the pest has come to notice.

Antirrhinum. The fungus **Phyllosticta antirrhini** was found associated with a leaf-blight and die-back of snapdragons in the Station grounds, and the rust **Puccinia antirrhini** occurred and caused damage in many gardens.

Gerberas. Rotting of the crowns of gerbera plants by **Sclerotinia sclerotiorum** occurred in a garden in Devonshire parish.

Roses. The black-spot fungus **Diplocarpon rosae** was common on rose-bushes, some varieties suffering very badly.

Poinsettia. Bushes of **Euphorbia pulcherrima** in a garden were badly affected by a blight of the leaves and die-back of the shoots. The first symptoms noticed were angular spots on the leaves with browning of the smaller veins and yellowing of the interveinal tissue. Bacteria were found to be present and also a species of **Phoma,** but which of these was the primary cause of the trouble remained undetermined.

Cosmos. Plants of Cosmos covered with a species of **Cuscuta** were brought to the Station from a garden in Paget East. No previous record of the occurrence of dodder in Bermuda seems to have been made.

CONCLUSION.

My tenure of the post of Plant Pathologist ended on 14th November. During the four years in which I have worked in this capacity many things have been started but few completed. The palmetto scale, in the control of which much time and effort have been spent, appears now to be checked. The main causes of loss in the tomato crop have been determined. But a formidable array of problems remains to be solved, problems concerned with the blights of celery and potatoes, the storage rot of carrots and other vegetables, pests and diseases of the onion crop. These troubles alone cause loss to Bermudian farmers amounting to many thousands of pounds annually, and their control represents only a portion of the task which awaits future plant pathologists in Bermuda.

Respectfully submitted,

T. A. RUSSELL,

Director of Agriculture.

29th February, 1936.

Report of the Agricultural Assistant, 1935.

Director of Agriculture,

I have the honour to submit my report for 1935.

FIELD TESTS.

The usual varietal tests and other field experiments were curtailed for various reasons. Some tests had to be abandoned on account of the damage caused by high winds and other unfavourable conditions, while others were neglected on account of the claims on the time of the staff in connection with the grading and packing of farmers' vegetables for export.

Carrot Test. Seed of Danvers Half Long obtained from Messrs. Henry A. Dreer, Inc., Philadelphia, U.S.A., was planted in South field (western plot of area 45 sq. rods) on 10th October, 1934, and the crop was reaped between 13th and 23rd February. The preceding crop had been soybeans which were planted during the summer and ploughed under early in August after which a light dressing of barnyard manure was applied. Various kinds of artificial fertilisers were also applied before and after sowing the carrots, the following being the treatments and results.

Plot	Fertiliser used		Yield per sq. rod
1	Sulphate of potash	800 lbs.	2.4 bushels
2	Nitrate of soda	800 "	4 "
3	Kainit	800 "	6 "
4	Castor Pomace	400 "	4.3 "
	Kainit	400 "	
5	Castor Pomace	800 "	4 "
6	Superphosphate	400 "	5 "
	Kainit	400 "	
7	Castor Pomace	400 "	4.3 "
	Superhosphate	200 "	
	Kainit	200 "	
8	Mixture 2-12-6	800 "	3.6 "
9	Castor Pomace	400 "	3.5 "
	Superphosphate	400 "	
10	Sulphate of Ammonia	800 "	3.25 "

In plots 1, 3, 4, 5 and 6 half the fertiliser was applied four weeks before seeding, the other half four weeks after; in plots 7, 8, 9 and 10, all was applied four weeks after seeding, while in plot 2 half was applied two weeks after seeding and half six weeks after seeding.

The average yield of reasonably good roots without tops was 4.5 bushels per rod or 720 bushels per acre, but during the process of grading for export some were rejected, making the marketable yield approximately 4 bushels per rod or 640 bushels per acre. This yield was satisfactory, and it probably exceeded the average farm yield by 25 per cent.

This was the first attempt in several years to test a number of artificial fertilisers. While the yields obtained from Kainit and Superphosphate were in this instance substantially higher than from any other mixture, it would be unwise to form any definite conclusions from this one test. It does, however, indicate that further experiments along the same lines might prove profitable.

Carrot Seed Selection. Seeds from a selection of stocklings sent to the Central Experimental Farm, Ottawa, in February, 1934, were planted, but through a series of unfortunate circumstances the experiment was lost. This is to be regretted, because a great deal of work has been put into this promising project both in Ottawa and here.

Tomato Test. An ambitious experiment to test six varieties and six artificial fertiliser mixtures was started in the fall of 1934, but unfortunately several days of wind of gale force in December destroyed the vines when the first trusses of fruit were ready for picking.

Potato Tests. Since the fall crop of Bliss Triumphs is planted at the end of one year and reaped the following year it has been the practice to record in the Annual Report the test of the previous year. This has led to some confusion, and in order to clarify the situation the fall plantings of 1934 and 1935 are dealt with in this report.

(i) Fall Planting 1934. The test commenced at the Agricultural Station with Bliss from Long Island, New York, and from Nova Scotia, Canada, was abandoned on account of unfavourable weather, which rendered comparison of no value. In observations of plantings made on several farms, however, it was found that seed supplied by Messrs. H. Zimmer & Son, Long Island, gave uniformly good results, the maximum infection by virus being about 5 per cent, while seed from Messrs. Dyal Corporation, New York, was badly infected with virus, from 5 per cent to 75 per cent of the plants showing symptoms of leaf-roll, and as a result the crop from this seed was very small. Most of the seed from Nova Scotia was highly satisfactory as regards freedom from virus, and the yields in most instances were good.

(ii) Fall Planting 1935. The test consisted of Bliss Triumphs of the following origin:

1. Grown in Long Island, N.Y., by Messrs. J. M. Lupton & Son, Inc., from Nebraska State certified seed stock.
2. Grown in Kings Co., Nova Scotia, by Messrs. Walter Steele and E. R. Jess from certified seed.

The seed was planted in western plot, South Field, on 10th October, 1935, and was dug on 13th January, 1936. Soy beans, grown in the plot during the summer, were ploughed under in August, and a light dressing of barnyard manure was applied to the ground prior to planting the potatoes. Seed from both sources germinated well and grew vigorously.

SUMMARY OF FIELD READINGS.

Origin of seed	Emergence 4 weeks after planting	Leaf roll	Mosaic	Average Yield per rod.
Long Island	91%	1.6%	.6%	113.4 lbs.
Nova Scotia	97.7%	Nil	.8%	133 lbs.

The plot was sub-divided into smaller plots of an area of 1¼ sq. rods, which were given applications of artificial fertilisers at the rate of 640 and 960 lbs. per acre following planting.

The following were the yields:

(1)	4 – 8 – 4	(960 lbs. per acre)	144.5 lbs. per sq. rod.
(2)	Castor pomace	(960 " ")	139.2
(3)	5 – 8 – 10	(640 " ")	137.2
(4)	5 – 8 – 7	(640 " ")	136.8
(5)	5 – 8 – 10	(960 " ")	130.4
(6)	4 – 8 – 4	(640 " ")	127.2
(7)	5 – 8 – 7	(960 " ")	126.6
(8)	No fertiliser		122.9

(iii) Winter Planting. Katahdins originating from Maryland, U. S. A., and Nova Scotia were planted at the Agricultural Station. No record of the yields was kept because the potatoes were dug prematurely for experimental shipments to the English market. Similar seed from Maryland, imported by Messrs. O. R. Loblein, Ltd. and distributed among several growers, cropped fairly satisfactorily however. No virus has been observed in any of the Katahdins planted so far. Observations in the United States indicate that the Katahdin is more resistant to virus than either the Irish Cobbler or Green Mountain.

Blight-Resisting White-skinned Varieties. Four samples of supposedly blight-resisting varieties were tested. The samples were secured from Mr. James K. Paisley, Albert, New Brunswick, Canada; they were Early White, Paisley's Cobbler, Golden Wonder, and Fortyfold. Samples of each variety were planted along with Garnets and Katahdins in Rosebank Field on 10th January. Early White proved more susceptible to blight than Katahdin, the first spots showing up within six weeks of planting, and in eight weeks the foliage was completely burnt up. The Chili Garnet is considered one of the best blight-resisting commercial varieties, but in this test the three other varieties proved more than its equal. All three varieties cropped heavily, but the tubers were small and irregularly shaped, and not suited for export purposes.

INSPECTION OF SEED POTATOES IN NOVA SCOTIA.

During one of my visits to the Maritime Provinces of Canada in connection with marketing, I took advantage of the opportunity to inspect the seed potato plantings in Nova Scotia. I accompanied Mr. W. K. McCulloch, District Inspector, on the first inspection of seed in Kings and Colchester Counties, from 15th to 23rd July.

Bliss Triumphs. In view of the heavy infestation of mosaic occasionally experienced in Bliss seed from Canada, I was particularly anxious to ensure that no virus-infected stock was shipped to us this year. With this in view, after inspection I classified the fields into three groups; Group No. 1 consisting of fields showing vigorous growth and good cultivation, freedom from virus and very little evidence of previous roguing; Group No. 2 of fields of similar vigour and freedom from disease except that there was evidence of previous roguing by a number of missing hills and a possibility of contamination by virus. Other fields, although not barred certification, I condemned owing to the greater risk of possible virus infection. I was able to arrange with the exporters to fill our requirements of seed as far as possible from Group No. 1, and this was reflected in the comparative freedom from virus and the good results obtained from our fall crop.

Chili Garnets. The acreage planted for seed was considerably smaller than last year. Growth was generally backward at the time of my inspection, and in some fields missing hills and weak plants were prevalent. All but one field passed first inspection, but it is possible that some virus may have shown up later.

Katahdins. This was the first year that Katahdins have been planted in Nova Scotia in commercial quantities. I inspected all the fields, and I was impressed with the complete absence of virus. This variety does not appear to rank with Bliss and Cobblers for earliness, and I do not think it is suitable for the fall crop here.

Cobblers. This variety comprises the major plantings in Nova Scotia, and it ranks with Bliss for earliness. Plenty of good stock is available, and I think that if it were given the same special treatment as the early Bliss it would crop equally well here in the fall as in the spring.

Remarks. The North Mountain district of Kings County is particularly suited to the production of clean Bliss seed of vigorous growth, and I think it would be wise for us to confine our purchases of Bliss largely to this district.

The difficulty experienced in getting Canadian seed in condition to plant here by 1st October, so that the crop may be dug by the end of the year, is being gradually overcome. The practice adopted by one grower in Nova Scotia, that of forcing the tubers to sprout by the aid of artificial heat and topping the vines about two weeks before digging, has made it possible to plant them here two weeks earlier than normally. Seed so treated in Nova Scotia and given a further chemical treatment here produces a crop almost as early as seed from Long Island.

As in the case of Bliss, Kings County appears to be a favourable area for growing Chilis.

MARKETING.

During the major part of the export season I was stationed in Canada, with headquarters in Montreal.

On the whole, the past season was one of the most successful the farmers of the Colony have experienced in the Canadian market. In contrast to other years prices for all commodities, excepting potatoes, were uniformly good throughout the season. To accomplish this some interchanging of supplies was practised between the brokers, which had a beneficial effect in keeping the produce moving rather than letting it accumulate at any one point and incur extra expense for storage and re-packing.

Marketing Methods. Most farmers find it more economical to market their crops through the Packing-houses, others find it more advantageous to pack as much as their facilities will permit on the farm and send the balance through the Packing-houses. While there is yet room for improvement in grading and packing all round, there has been a general improvement in this respect, and some farmers have made decided progress in improving the grade and quality of their packs. This phase of our agricultural problem deserves every encouragement, because the success of the industry largely depends on capable and industrious farmers who are able to employ labour economically and to farm on a large scale, rather than on the encouragement of small holdings with their attendant high overhead which entails more Government assistance and supervision.

The system of having only representative brokers in the key cities to handle all the produce was threatened on two or three occasions during the season. While no system is perfect, after six years' personal contact with marketing in Canada, the writer is convinced that no system would have served our purpose as well.

Our brokers in Canada have been handicapped by the lack of facilities in Bermuda to handle shipments in a satisfactory and orderly manner, and the origin of most of the bad breaks experienced from time to time may invariably be traced to this end. Until such time as adequate cold storage facilities are available in Bermuda the problem of supply and demand cannot be completely solved, but in the meantime closer co-operation between the Department and the shippers in the allocation of shipments to the different markets and if necessary the withholding of supplies would eliminate some of the handicaps which the brokers now have to contend with, and the growers would benefit by it.

COMMENTS AND CONDITIONS.

Beans. Our experience thus far in the selling of beans in Canada has not been successful. Several of the small shipments sent forward last season did not realise expenses. In contrast to most of our export vegetables, beans cannot be successfully stored for any length of time, and consequently have to be sold immediately after arrival irrespective of market conditions. So far no effort has been made to grow a crop of beans exclusively for export; the small shipments that have been made from time to time have been largely surpluses over the local market requirements, and in most instances the quality has been poor. The tendency last season, as in former seasons, was to ship overgrown stock. Under such conditions they cannot be sold profitably even though the market should be bare at the time. Not all the shipments were in that condition, however, because occasionally among the shipments were found crates of good quality which proved that by care and attention the difficulty might be overcome. The majority of the shipments made were packed in the tomato lug unlined with paper, and carried fairly satisfactorily. A few came packed in bushel crates, and proved the unsuitability of the bushel crate for the purpose of shipping beans.

There is a reasonable chance of developing a fairly remunerative market for beans in Upper Canada, but unless greater attention is paid to their growing and shipping our efforts will continue to be unsatisfactory.

Beets The sale of beets last season proved to be the most satisfactory in six years. Ordinarily there is very little demand in Upper Canada for beets without tops until very late in the season, but last season was an exception. The reason for this was largely the limited supply of the stored domestic crop, which afforded an outlet for ours in the restaurant and hotel trade sooner than usual. Taken on the whole, the shipments were of better quality than in previous seasons, and this and the better market demands accounted for the better returns. It must not be assumed, however, that larger shipments of beets cannot be disposed of satisfactorily under ordinary market conditions in future seasons, because better grading and packing and a continuity of supply will surely create an increased demand and better prices.

Cabbage. Early shipments of cabbage to the Maritimes realised fairly good prices. Early in the season the volume of business does not warrant the importation of American cabbage in car-lots, consequently smaller than car-lot shipments transported by boat and rail from Boston are usually high-priced. This sets a fairly high value for Bermuda cabbage, and until the demand is sufficiently heavy to warrant car-lot shipments from producing points, fairly good prices are maintained. But as soon as car-lots appear on the market prices drop quickly. The grading and keeping quality of the carload importations is usually far superior to ours, so apart from the lower prices our cabbage is also discriminated against on account of the quality. There was a great variation in the quality shipped during the season. Some farmers still persist in growing the variety Succession. Any flat variety finds no favour especially on a glutted market.

Poor prices were received in Montreal for cabbage, but farmers insisted upon shipping there. Ordinarily Montreal is a poor market for our cabbage, and only during an extreme market shortage can good prices be realised.

Carrots. Carrots sold much better than in the previous season. The loss on account of the fungus Sclerotinia was comparatively small compared with loss in 1934. The supplies came forward in fairly acceptable quantities for the requirements of the different markets, although a few cars had to be transferred from one market to another in order to get the best prices. The Maritime buyers complained of the small size roots in many of the shipments, and in some instances a lower price had to be accepted for these. As pointed out several times before, the Maritime markets demand a large size carrot, and it is not advisable to ship small carrots there except when supplies are very short. On the other hand, the Upper Canada market will accept smaller roots, though medium sized roots are more saleable. Last season might be considered a normal season for carrots, and excepting the last two shipments to Montreal the supply of the type of carrot that we ship was adequate to meet the demand. Greater attention might be given to growing extra supplies for shipment to Montreal during the last two weeks in June and the first week in July, because usually at this time of the year only small new domestic carrots are available, and there is a considerable demand for more matured stock for passenger steamers, etc.

Celery. The celery shipped was of the best quality in three years, and considering market values of other sources of supply we obtained very good prices. Three or four farmer-shippers made a decided effort to put up a superior pack, and this with descriptive list of sizes which they furnished the brokers, helped them to get the best market prices. Every effort was made to sort out the mixed shipments, so that the poorer lots might not affect the sale of the better packs. This work entailed a great deal of extra handling under difficult circumstances. The docks in Canada are not the best place to do this sort of work because it has to be done within sight of the buyers, which creates a bad impression and a great deal of confusion. The shippers may well consider a scheme of sorting and marking the different grades prior to shipment. They will be repaid for their trouble by better prices and a wider distribution.

Cucumbers. There is usually a splendid demand for cucumbers during our shipping season. The demand is largely filled by imported hothouse stock, and compared with the uniformity of grade and the dark green colour of these, our cucumbers look very unattractive. Apart from their unattractive appearance they lack keeping qualities. It is a mistake to ship cucumbers in chilled space as they deteriorate quickly in ordinary temperature after being in the chillroom.

Onions. Very encouraging prices were received for all the shipments of onions. The quality on the whole was a little better than the previous two seasons, but inferior to the crops of 1931 and 1932. The good onion market last season was rather an unusual occurrence and unlikely to be repeated next year. The domestic crop cleaned up earlier than usual, the New Zealand crops failed to materialise and for some reason or other the imports from Egypt were much smaller than usual. The shortage was not apparent when the first shipment arrived in Montreal by the Lady Rodney on 12th May, but by the time the Lady Somers arrived on the 27th May we realised that the market was definitely short of supplies.

Under ordinary market conditions good quality Bermuda onions are worth from $1.50 to $1.75, but the market shortage this season enabled us to realise $2.50 for the majority of the shipments.

Potatoes. The situation in respect to potatoes was the reverse of that described for onions. Shipments made in March and April sold at

encouraging prices, but shipments following the first direct sailing to Montreal after the opening of the St. Lawrence River for navigation sold for low prices, especially the Garnets, of which about twelve hundred crates were unsold at the end of the season.

It has been pointed out that Garnets are not liked in Canada, and the planting of this variety has been discouraged for this reason. Prior to the opening of the South Carolina season, usually the first half of May, red-skinned potatoes may be sold, if whites are not available, but the discrimination against Garnets appears to be greater than it is against Bliss or Early Rose.

The collapse of the potato market so early in the season was unusual, and it developed so quickly that it was impossible to forewarn against shipping. The last shipment sold on an orderly basis was by the Lady Somers which arrived in Montreal on 27th May. The Cobblers in this shipment were sold prior to arrival at basis $2.15 per crate for No. 1's. Before these were cleared off the wholesalers' hands a shipment of South Carolina Cobblers arrived on the market, and wholesale prices receded quickly and an unusual situation developed. For some inexplicable reason the increased demand usually associated with lower prices did not occur, with the result that supplies kept backing up. Even though chain stores featured No. 1 grade potatoes at as low a price as 19 cents for 5 lbs., life was not added to the dull market, and this stagnant condition continued to the end of the season. Number two's soon became unsaleable, and to relieve the situation a shipment of over a thousand crates from Montreal was sent to the United Kingdom.

The plentiful supply and good demand of domestic potatoes were no doubt also responsible to some extent for the decreased demand for new stock. Very good quality old potatoes were available during our shipping season at less than one cent per pound retail.

Tomatoes. The crop (68,697 crates) was the largest shipped to Canada so far. The quality of the fruit was far below the average of the previous year, and we were indeed fortunate in securing the prices we did. Notwithstanding the poor quality of the crop, several thousand more crates could have been sold. The markets outside of the Maritimes and Montreal were hardly tapped, and had the quality of the fruit been first class twice the quantity could have been sold in Montreal alone.

To what extent the cold storage facilities here helped the marketing of the crop is difficult to judge, but there was abundant evidence throughout the season that the facilities are far from being satisfactory. Many price allowances had to be made on account of the unsatisfactory condition of the cold storage shipments. The chief factors were abnormal ripening, the fruit turning to an uneven yellowish pink colour instead of red, a sour stale taste, and the acceleration of bacterial and fungal rots presumably caused by the exposure to high temperatures during transfer from cold storage to the ships' chambers.

Acknowledgment. Amongst the many to whom I am indebted, special mention is due to the representative brokers whose co-operation and assistance I received at all times, and to Mr. C. R. Johnson, Canada Cold Storage Co., Montreal, and Mr. H. C. Collier, Secretary of Canada West Indies League, for assistance and advice.

I wish also to gratefully acknowledge courtesies extended to me by the management of the Canadian National Steamships and other officials of the Company, from whom I received privileges in arranging the produce for inspection on the dock.

Respectfully submitted,

W. R. EVANS,
Agricultural Assistant.

5th March, 1936.

Report of the Inspector of Produce, 1935.

I have the honour to submit my report for the year 1935.

PACKING HOUSE INSPECTION OF EXPORT VEGETABLES

Three Government Packing-Houses were in operation throughout the season. No. 1 Packing House, situated at the Agricultural Station, was opened in December 1934 for the packing of export vegetables. No. 2 Packing House, also in the Station grounds, was opened on 27th May for the packing of tomatoes. The Southampton Packing House was opened on 22nd April, and all vegetables except tomatoes and celery were received. All the Packing Houses were closed by 4th July.

Quantities Shipped. See Director's report.

Comments. The following general remarks are made on vegetables delivered to the Packing Houses.

Beans were of fair quality. Some growers continued to bring them in overgrown.

Beets were generally good.

Cabbage was generally good.

Carrots were of fair quality. Some growers brought in good clean carrots throughout the season.

Cucumbers were overgrown and corky. Only a small quantity was brought in for packing.

Onions were small in quantity and variable in quality, but towards the end of the season some good lots were delivered for packing.

Parsley. A small quantity was shipped in good condition.

Tomatoes. The increased importance of tomatoes as an export vegetable has resulted in farmers taking greater care in growing and handling the crop. A number of the growers consistently brought in lots which were almost free from damaged fruit.

Potatoes. Triumphs grown from Canadian seed were of good size and quality, and some growers obtained above-average crops.

Garnets cropped heavily, and were in good condition.

Cobblers showed black-eye rot in various lots.

Other Vegetables. Small quantities of miscellaneous vegetables were received in good condition.

Quantities of Crates on Hand. At the close of the season the crate material on hand was sufficient to make up:

Bushel crates	15,275
Long-type bushel crates	3,150
Cabbage crates	1,962
Tomato crates	22,200
Bushel bags	5,000

DOCK INSPECTION OF EXPORT VEGETABLES.

Mr. C. V. S. Early, Assistant Inspector of Produce, was on duty at the dock from 1st January to 30th June. Sub-Inspectors were on duty when required.

Comments. The following comments are made on vegetables brought direct to the dock.

Farm-Packed Vegetables to New York.

Kale was generally in good condition.

Garnets were in excellent condition.

Small consignments of other vegetables were shipped in good condition.

Farm-Packed Vegetables to Canada.

Carrots were of average quality.

Celery. A good crop was harvested, and the general condition of the shipments was good.

Onions were in good condition.

Cabbage was good.

Tomatoes. Less than 2 per cent of this crop was shipped farm-packed. It was of varying grade, the fruit immature, and the pack was generally poor.

Other Vegetables. Small shipments of beets, parsley and cucumbers were of fair quality.

Produce Rejected at Dock (Farm-Packed).

Beets	39 crates
Cabbage	95 "
Carrots	288 "
Celery	322 "
Onions	35 "
Potatoes	352 barrels
Potatoes	185 crates
Tomatoes	–
Kale	145 crates
Total	1,461 packages

Appeals. Nil.

Quantities of Farm-Packed Produce Shipped. See Director's report.

Prosecutions. Nil.

Supervision of Chill-Rooms. Throughout the season the chill-rooms of steamers were frequently inspected by Assistant Inspector Early, the Sub-Inspectors and myself. Stowage was found to be satisfactory, and the percentage of breakage was small.

Acknowledgment. I wish to record my appreciation of the assistance and co-operation rendered by Mr. P. L. Spurling, Foreman of Messrs. Pearman, Watlington & Company's Cold Storage Plant.

SEED POTATOES IMPORTED

Triumphs	from	Long Island	195 barrels
"	"	Canada	2,503 "
Garnets	"	"	825 "
Cobblers	"	"	1,575 "
"	"	"	576 bags
Katahdins	"	"	1,539 barrels

Remarks on Condition. All seed potatoes were in excellent condition.

CRATE MATERIAL AND COOPERAGE IMPORTED

Crate material was inspected on arrival and found to be in good condition. Barrel material was also of good quality.

LILY FIELD INSPECTION.

See Plant Pathological report.

PACKING HOUSE INSPECTION OF LILY BULBS.

Inspection of bulbs for export commenced on 3rd July. Bulbs cropped well, and condition was up to the average, with very few blown. Basal rot was noticed, but to no great extent. The licensed exporters, with the exception of one, showed great care in grading and selection of the bulbs, and in most instances packing was good.

FARMERS' MARKET.

Owing to the alleged pilfering among stall-holders, it was decided to restrict admission to the building to business hours, and to have the Market opened at 7 a.m., and closed at 5 p.m. by an Inspector of Produce or by an employee of this Department. This was done throughout the year, and was found satisfactory.

RECOMMENDATIONS.

(i) It is recommended that all vegetables brought to the Government Packing Houses should be inspected before an inward receipt is issued. Those lots showing a high percentage of rejects should be condemned provisionally, until the grower has re-conditioned them to the Inspector's satisfaction. Facilities for picking over such deliveries should be provided by the Inspector. This recommendation is of primary importance to the efficient and economical working of the Packing House. Low quality produce, containing a large proportion of rejects, slows up the grading machine, and consequently the packers cannot be kept working at normal speed.

(ii) It is recommended that potatoes showing a large percentage of blackeye rot should not be accepted in any circumstances.

OTHER WORK.

I made surveys during the crop season and duly reported on the same. At the close of the vegetable packing season I attended to the laying up and lubricating of all grading machinery. I made periodic visits to the three Packing Houses during the summer.

Respectfully submitted.

T. A. HOLLIS,
Inspector of Produce.

12th February, 1936.

Report of the Government Veterinary Officer, 1935.

The Director of Agriculture,

I have the honour to submit my report for the year 1935.

Local Outbreak of Infectious Diseases. There were several cases of distemper among dogs during the year, but no serious outbreak. There was no outbreak of disease among other animals.

Importation of Animals. The following domestic live stock were imported:

Horses	146	Increase of 41
Ponies	2	" " 2
Dairy cattle	34	Decrease of 36
Pigs	8	" " 14
Poultry	10,178	Increase of 843
Dogs	227	" " 11
Miscellaneous	977	" " 63

Of the miscellaneous class there was one lot of birds, numbering 39, for the Bermuda Aquarium.

All imported pigs were vaccinated against hog cholera, and all other animals not accompanied by proper certificates were treated in accordance with the requirements of the Board's Bye-Laws.

Visits of Inspection. During the year I made 304 visits of inspection to animal quarters on vessels and 325 visits to various parts of the Islands to inspect coolers, to inoculate animals in connection with licences for the sale of milk, and also for the purpose of making agglutination tests for contagious abortion in cattle. Of 93 animals submitted to this test 35 reacted. Dairy animals submitted to the tuberculin test numbered 1,470, an increase of 140 over last year. Of the animals tested only 22, or 1.5 per cent, reacted positively and were destroyed. All cattle in Somerset were again found free from tuberculosis.

Condition of Dairy Stock. The general condition continues to improve. The scrub bulls are getting fewer each year.

Farmers' Market. The market was visited weekly, excepting during the two weeks I was on leave. The condition of the stalls continues to improve. The quality of beef offered for sale is fair, and pork is good.

The premises on which animals are slaughtered for sale in the market remained in a sanitary condition.

Private Markets. The coolers of the various private markets were inspected frequently and conditions found satisfactory.

Horse Show. The Command Horse Show held on the Exhibition grounds was well conducted and patronised.

Issue of Pharmaceutical Material. Professional evidence was given in 11 cases prosecuted by the Police Department — an increase of 3 over 1934.

Record of Movements. I was absent on leave from 20th November to 2nd December, when I went to the United States on private business.

Respectfully submitted,

C. J. COOPER, V.S.
Government Veterinary Officer.

Pembroke,
20th January, 1936

Appendix A.

EXPORTS OF VEGETABLES (IN BUSHELS) AND BULBS (IN CASES) DURING THE TWENTY-YEAR PERIOD, 1916 TO 1935.

Year	Beets	Cabbage	Carrots	Celery	Kale	Onions	Parsley	Potatoes	Tomatoes	Veg. n.o.p.	Total Vegetables	Bulbs
1916	55,582	212	62,349	45,161	3,110	148,221	75,735	159,965	–	33,499	583,384	1,224
1917	38,316	1,842	48,670	22,166	16,585	132,358	65,409	201,685	198	26,412	553,641	1,009
1918	11,431	–	20,730	13,460	2,496	133,141	11,570	**216,421**	–	6,111	415,360	823
1919	17,514	30	48,909	28,713	3,315	131,271	44,228	132,256	484	13,649	420,369	664
1920	35,123	19	92,736	21,237	17,021	109,072	**90,285**	156,464	–	14,870	536,827	749
1921	31,845	–	115,278	31,979	23,311	49,441	64,514	157,476	161	8,748	482,753	936
1922	21,947	–	76,348	28,403	12,397	70,874	46,267	116,403	–	6,443	379,082	1,604
1923	28,007	279	60,874	40,302	16,302	35,176	40,688	89,611	1,024	6,478	318,741	3,116
1924	28,984	267	88,745	67,191	28,053	41,848	56,346	94,011	1,048	10,111	416,604	3,539
1925	18,263	–	62,620	41,210	26,118	21,570	56,579	62,635	624	11,478	301,097	4,040
1926	18,075	–	68,996	74,572	28,599	39,336	82,881	91,933	3,081	7,931	415,404	4,524
1927	11,366	–	44,833	109,302	23,319	19,930	55,619	96,192	5,396	3,759	369,716	5,943
1928	15,580	–	42,450	129,266	41,481	16,063	60,318	110,136	1,584	4,124	420,802	**7,611**
1929	1,225	1,188	19,337	**155,894**	24,156	4,055	32,148	97,874	8,051	1,997	345,925	5,864
1930	489	2,061	19,255	113,080	14,220	10,737	11,431	65,953	6,581	1,782	245,559	5,508
1931	620	5,109	10,956	46,510	11,199	3,412	378	48,435	4,900	234	121,753	4,270
1932	1,369	11,994	17,899	49,004	14,544	29,412	1,196	35,925	10,241	1,234	172,818	3,009
1933	1,237	**12,896**	26,005	19,846	9,294	22,483	664	44,588	13,852	2,877	153,742	2,014
1934	1,343	8,866	24,417	15,818	9,402	18,696	477	46,514	17,055	606	143,194	2,309
1935	1,510	9,632	**25,923**	25,766	**6,024**	**9,365**	**149**	35,979	**22,942**	**644**	**138,476**	2,490

The largest shipment of each vegetable and of bulbs, within the period, is shown in black-faced type.

Appendix B.

RAINFALL RECORDED AT AGRICULTURAL STATION, 1935.

January	4.95 inches
February	4.11 "
March	5.72 "
April	5.23 "
May	5.39 "
June	2.02 "
July	4.39 "
August	11.02 "
September	5.05 "
October	6.25 "
November	5.05 "
December	5.67 "
Total	64.85 inches

Rainfall for Last Five Years

1930	59.20 inches
1931	50.67 "
1932	53.32 "
1933	46.22 "
1934	56.67 "

C.V. S. EARLY,
Station Foreman

5th March, 1936.

Appendix C.

FINANCIAL STATEMENTS.

(a) EXPENDITURE (Exclusive of Personal Emoluments) for the Year Ended 31st December, 1935.

GENERAL GRANT

Appropriated by Act No. 38 of 1934		£1,300 0 0
Labour for experimental plots, lawns, flower-beds, roads, live stock, etc.	£1,056 18 3	
Seed potatoes and other seed	45 17 7	
Prison labour	7 6 0	
Cartage and ploughing	31 10 9	
Manure and fertilisers	1 16 5	
Live stock — feed, bedding and incidentals	24 10 2	
Repairs and renewal of buildings, tools, etc.	63 1 10	
Printing	46 17 8	
Unexpended balance	22 1 4	
	£1,300 0 0	£1,300 0 0

Inspection Services, Market Investigations and Contingencies.

Appropriated by Act No. 38 of 1934				£	800	0 0
Inspection of vegetables at dock and at packing houses	£	102	16 0			
Representation in Canada		343	16 0			
Advertising in Canada		105	18 6			
Advertising lily bulbs in England, including cost of bulbs and fee to representative		78	5 10			
Celery tags		6	10 0			
Experimental Shipments to England		8	18 11			
Experimental Shipment of lily bulbs to Sweden		58	13 5			
Subscriptions to periodicals		4	4 3			
Cables		86	5 11			
Unexpended balance		4	11 2			
	£	800	0 0	£	800	0 0

Control of Animal Diseases.

Appropriated by Act No. 38 of 1934				£100	0	0
Appropriated by Supplementary Grant No. 23 of 1935				100	0	0
Compensation to owners of condemned stock	£186	0	0			
Supplies and contingencies		13	3 8			
Unexpended balance			16 4			
	£200	0	0	£200	0	0

Control of Plant Diseases and Pests

Appropriated by Act No. 38 of 1934				£150	0	0
Labour	£	17	13 3			
Fungicides and insecticides		58	14 10			
Repairs to spraying machines		13	9 0			
Hand-duster		3	9 9			
Rotary blower		5	1 9			
Cold storage in connection with lily experiment			3 0			
Subscriptions to periodicals		5	4 10			
Printing		12	6 0			
Unexpended balance		33	17 7			
	£150	0	0	£150	0	0

Horticulture

Appropriated by Act No. 38 of 1934							£150	0 0
Labour	£	37	0	6				
Repairs to glasshouses		13	6	2				
Repairs to mower		16	9	0				
Repairs to rototiller		14	7	9				
Mower and edge-cutter		8	18	9				
Seeds, bulbs and plants		5	5	10				
Printing		13	15	6				
Subscriptions to periodicals		3	17	0				
Unexpended balance		36	19	6				
	£150	0	0				£150	0 0

Departmental Contingencies, Travelling Expenses Telephones, Lighting, etc.

Appropriated by Act No. 38 of 1934							£120	0 0
Local travelling expenses	£	14	7	9				
Stationery and other office supplies		41	16	11				
Printing		28	9	7				
Foreign postage		8	0	0				
Repairs to clock			12	0				
Repairs to typewriter		1	5	0				
Lighting and power		9	8	5				
Telephones		11	12	0				
Unexpended balance		4	8	4				
	£120	0	0				£120	0 0

Packing House, Services and Contingencies

Appropriated by Act No. 38 of 1934							£4,000	0 0
Tying machine	£	15	11	9				
Packing House supplies:								
Stencils	£	4	8	7				
Hatchets		4	12	0				
Stek-O paste		8	6	8				
Wrappers		142	5	9				
Nails		97	16	11				
Bags		62	3	6	319	13	5	
Labour: Pasting labels, making crates, grading, packing, etc.					2,278	19	10	
Labour: Construction					33	9	6	
Electric current — light and power					37	0	3	
Telephones (2)					6	0	0	
Rents: B. Store, Hamilton dock		15	0	0				
Southampton Packing House site		11	0	0	26	0	0	
Carried forward					£2,716	14	9	£4,000 0 0

Brought forward				£2,716	14	9	£4,000	0 0
Repairs to buildings				35	11	1		
Cartage of packed vegetables:								
from Station	361	12	0					
from Southampton	302	16	8					
from cold storage	38	5	6	702	14	2		
Cold storage, chiefly of tomatoes				364	18	7		
Insurance of Packing Houses				33	12	0		
Printing and Stationery				43	12	6		
Wide-carriage typewriter				36	8	0		
Unexpended balance				66	8	11		
				£4,000	0	0	£4,000	0 0

(B) REIMBURSEMENTS TO GOVERNMENT.

Sale of vegetables							£ 65	0 4
vegetable plants							5	10 0
ornamental plants							17	16 0
spraying material							1	2 0
Veterinary fees							7	12 2
Seedmen's licenses								10 0
Packing House receipts:								
Charges for packing and grading				£2,083	2	5		
Charges for material and labour on crates				873	8	6		
Rail-freight from Southampton				109	17	6	3,066	8 5
							£3,163	18 11

(c) FARMERS' MARKET.

Received for hire of stalls							£30	16 0
Rental of market				£23	19	5		
Lighting				6	16	7		
				£30	16	0	£30	16 0

HILDA C. LINES,
Clerk, Board of Agriculture.

10th March, 1936.

Appendix D.

DISPOSAL OF PRODUCE, 1935.

Milk to King Edward VII Memorial Hospital			£10 12 0
Vegetables to Hospital and other institutions			8 4 0
			£18 16 0

Note. Most vegetables were shipped experimentally.

C. V. S. EARLY,
Station Foreman.

5th March, 1936.

Appendix E.

LICENSED VETERINARIANS.

R. L. Tucker, D. V. S.
C. J. Cooper, V. S.
J. W. Sutherland, B. V. Sc.

Appendix F.

LICENSED SHIPPERS OF PRODUCE.

Bermuda Green Vegetable Growers' Association.
A. C. Benevides.
J. M. Darrell.
Henry Dunkley & Co.
The Hill Co.
O. R. Loblein, Ltd.
Pearman, Watlington & Co.
Manuel F. Simons (kale to United States of America).

LICENSED FARMER-SHIPPERS.

F. A. Hollis
Malcolm Hollis
Gabriel Jacome
M. F. King & Son
M. S. Madeiros
E. J. Moniz
J. DeMoura
Bento Oliviera & Son
E. W. Outerbridge
J. R. Outerbridge
D. C. Robinson
M. F. Simons
P. B. Stephens
J. DaCosta Da Silva
K. A.Wilkinson
R. B. Watson.

LICENSED LILY SHIPPERS.

T. O. Covel
Henry & Lee
Malcolm Hollis
E. W. Outerbridge Co.
J. R. Outerbridge
H. E. D. Smith.

AGRICULTURAL STATION.

The Agricultural Station is within twenty minutes walk of Hamilton Post Office, and is situated in Paget on Point Finger Road near the King Edward VII Memorial Hospital.

At the Station may be seen many trees, shrubs and other plants, the majority of which are labelled, and also experimental plots for vegetables.

The offices of the Department of Agriculture are situated at the Agricultural Station, and are open from 7 a.m. to 5 p.m., Sundays excepted.

GOVERNMENT PACKING HOUSES.

Two Government Packing Houses are situated at the Agricultural Station and one at Evans Bay Railway Station, Southampton. At these, farmers' produce is graded and packed for shipment.

FARMERS' MARKET, HAMILTON.

The Farmers' Market, Front Street, Hamilton, is under the supervision of the Department, and applications to sell therein should be made to the Inspector of Produce.

The Market is open from 7 a.m. to 5 p.m. (10 p.m. on Saturdays) on all days except Sundays and holidays.

INSPECTOR'S OFFICE.

The office of the Inspector of Produce is situated at No. 1 Shed (ground floor), Front Street, Hamilton.